



TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Bridging Team Efforts Supporting Current & Future Forces

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The purpose of this presentation is to provide an **overview of TARDEC Bridging Team's efforts** in supporting the sustainment of fielded systems, current development, acquisition and production of gap defeat systems and technology efforts for the Future Force.

Mission Statement

To provide sound engineering support and technological advancements in military bridging systems to our customers and to be recognized as acquisition specialists and the technology leaders for future bridging systems.



TARDEC Bridging Team Roles & Responsibilities



- IPT/Matrix Support to PM Bridging, PM HBCT, and PSID
 - Market Research, Market Investigations
 - Performance Specifications, Purchase Descriptions
 - Requirements and Acquisition Documentation
 - Inspection Of Fielded Bridges
 - Test Reports/Planning/Monitoring
 - **Procurement Work Directives (PWD) & 339's**
- Areas of Technical Expertise
 - Simulation & Structural Strength Testing
 - Finite Element Modeling & Analysis
 - Fatigue Analysis
 - Military Load Classification (MLC)
- Support for Emerging Technology
 - Army representative for STANAG 2010 & 2021 (MLC Rating and Marking)
 - US Army representative for Trilateral Design & Test Code

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- Agreed to by United States, United Kingdom and Germany
- First published in 1974
- Bridging and gap-crossing equipment will be designed to meet **the user's requirement by applying the necessary loading** conditions, design parameters, and testing given in this Code
- The Code covers loading, design, and testing requirements to be used for the development of military clear-span bridges, piers, floating bridges, rafts, equipment causeways, and erecting and launching structures that are part of the equipment



Load frame occupies 150' x 65' hangar bay with 23' tall x 32' wide door opening to an additional 60'x60' reinforced concrete pad

Capable to test bridges up to 32' wide and 210' long

Capacity	1 Million Pounds, 10 actuators
Max Bridge Size	210' Length, 32' width, 23' height
Perimeter clearance	15'
Overhead Clearance	28'
Exterior Access	Door size (23' height, 32' width)
Hydraulic Service	2500 psi Pressure, 100 gpm Flow
Electric Service	200hp, 480V
Pneumatic Service	100 psi Pressure, ½ hp capacity
Classified?	No



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M104 Wolverine (Heavy Assault Bridge)



Composite Army Bridge (CAB)



Armored Vehicle Launched Bridge (AVLB)



Vanadium Bridge (experimental customer test)



Support Bridging



Standard Ribbon Bridge bays in Raft configuration
Bridge Erection Boats provide raft propulsion



Standard Ribbon Bridge bays in Bridge configuration
Bridge Erection Boats provide temporary anchorage

- The Multi-Role Bridge Company Equipment:
 - Common Bridge Transporter, Improved Boat Cradle & Bridge Adapter, Pallet, M1077 Pallet, Palletized Load System Trailer, Dry Support Bridge, Improved Ribbon Bridge/Standard Ribbon Bridge, Bridge Erection Boat
 - Objective is 23 full companies and one training company



- Description: The CBTS is a grouping of 5 components:
 - HEMTT Common Bridge Transporter (CBT): designed to lift and transport all bridging flat racks
 - M1077 Flat rack: designed to carry bridge sections
 - Improved Boat Cradle (IBC): designed to carry the BEB
 - Bridge Adapter Pallet (BAP): designed to carry IRB sections
 - Palletized Load System Trailers (PLST): to increase haul capacity
- Current Status:
 - Production & Deployment



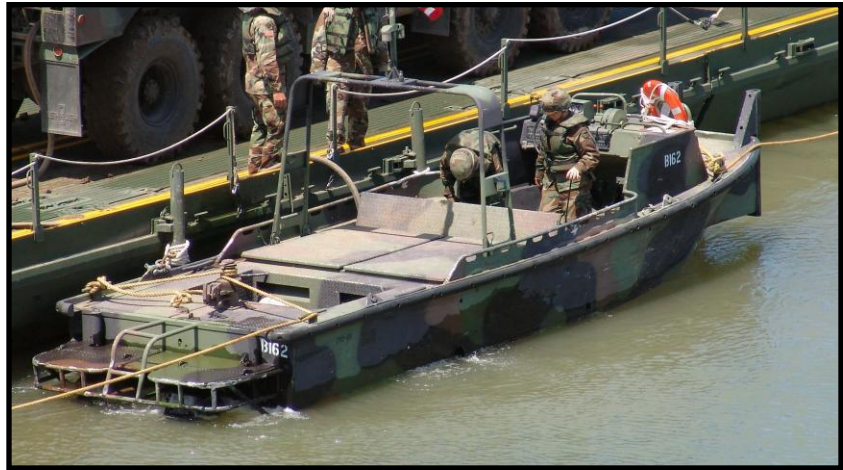
- Description:
 - Modular Bridge System for constructing 0-40m Main Supply Routes
- Specs:
 - MLC 80T/96W, 40m, 4 trucks w/trailers, crew of 8
- Manufacturer:
 - United Kingdom contractor
- Current Status:
 - Production & Deployment
 - R&D 46m capabilities



- Description:
 - Legacy, hand-built, deck type, two-girder, Multi-span bridging system
- Specs:
 - 2 span double story up to 51.5 m with a MLC of 70 ton
 - 3 span double story up to 76 m with a MLC of 70
- Manufacturer:
 - United Kingdom contractor
- Current Status:
 - Operations & Support for approximately 40 ~ 50 fielded globally
 - Repalletization on M1 and M3 flatracks



- Description:
 - Float bridge providing assault and tactical bridge and ferry capabilities for infinite span wet gaps
- Specs:
 - MLC 80T/96W; 10 fps currents; Two-lane traffic; CBT transport
- Manufacturer:
 - German contractor
- Current Status:
 - Production & Deployment
 - Development of Improved Anchorage System



- Description:
 - Workboat used to build and anchor float bridges and maneuver rafts
- Specs:
 - Mk I/II (standard), Mk 2R (re-powered)
 - 27 ft, twin-engine, twin-jet, 10000 lbs, 2 crew
- Current Status:
 - Operations & Support of 350+ in service
 - New Program of Record, Projected award 2QFY10
 - CRADA – USMC Mk III BEB



- Description:
 - Semi-permanent modular bridge system used to restore or maintain lines of communication routes for both civilian and military traffic
- Specs:
 - Multi-span bridge design constructed at any length on fixed or floating supports
 - MLC 100W/80T, crew 29 soldiers & 1 crane, 8 hours, 50 m of bridge
- Current Status:
 - Program Of Record LOCB:
 - Capability Production Document approval anticipated 4QFY08
 - Competitively procure LOC bridges beyond the ONS requirements through full and open competition; Projected award 2QFY10



- Description:
 - World War II legacy bridge of through-type truss design supported by two main girders formed from 10-ft steel truss sections
- Specs:
 - MLC varies with configuration:
 - 80 ft span triple/ single is MLC 80
 - 130 ft span triple/ single is MLC 20
- Current Status:
 - Over 180 bridge sets are distributed throughout the US Army around the world; No additional procurement is scheduled

Assault Bridging



- Description:
 - C130 transportable bridge for SBCT
- Specs:
 - MLC 40, 13m, crew of 2
- Manufacturer:
 - German contractor
- Current Status:
 - Production and Deployment
 - Development of Under-ride bar, Arctic Kit



- Description:
 - Legacy folding, scissors-type assault bridge designed to assist militaries in rapidly deploying tanks and other armored fighting vehicles
- Specs:
 - MLC 60/70 ton, 60 foot span bridge on M60A1, M48A5 Chassis
- Manufacturer:
 - U.S. contractor
- Current Status:
 - Operations & Support of over 700 AVLB systems
 - RESET/RECAP Hydraulic and Electric Upgrade at ANAD



- Description:
 - Armored vehicle designed to carry, emplace, and retrieve a Heavy Assault Bridge capable of supporting heavy loads such as the M1A2 main battle tank
- Specs:
 - MLC 70 ton, 24 m gap
- Manufacturer:
 - German contractor - Bridge
 - U.S. contractor - Launcher
- Current Status:
 - Operations & Support of 44 systems
 - Resolution of long-standing field problems



- Description:
 - Future assault bridging platform, designed to keep pace with the armored force; Consists of an M1A1 chassis, bridge launcher, and AVLB 70 bridge
- Specs:
 - MLC 70, Span: 18.3 m
- Manufacturer:
 - JAB designed in-house by Marine Corps Systems Command (MCSC)
 - Anniston Army Depot (ANAD) is production site
- Current Status:
 - Program lead transferred to Army; acquisition strategy being revised



- Description:
 - Full tracked combat engineer vehicle for the MAGTF & Army HBCT to breach minefields & complex obstacles and provide in-stride breaching capability to maneuver forces
- Specs:
 - M1A1 Abrams tank hull
 - 2 Mk 155 Linear Demolition Charge systems
 - Interchangeable Full Width Mine Plow & Combat Dozer Blade
 - 2 lane marking systems
- Manufacturer:
 - JAB designed in-house by Marine Corps Systems Command (MCSC)
 - Anniston Army Depot (ANAD) is production site
- Current Status:
 - USMC Lead with the Army as a participating DoD component as established in a signed Memorandum of Agreement.
 - Production and Deployment

Future Bridging Programs

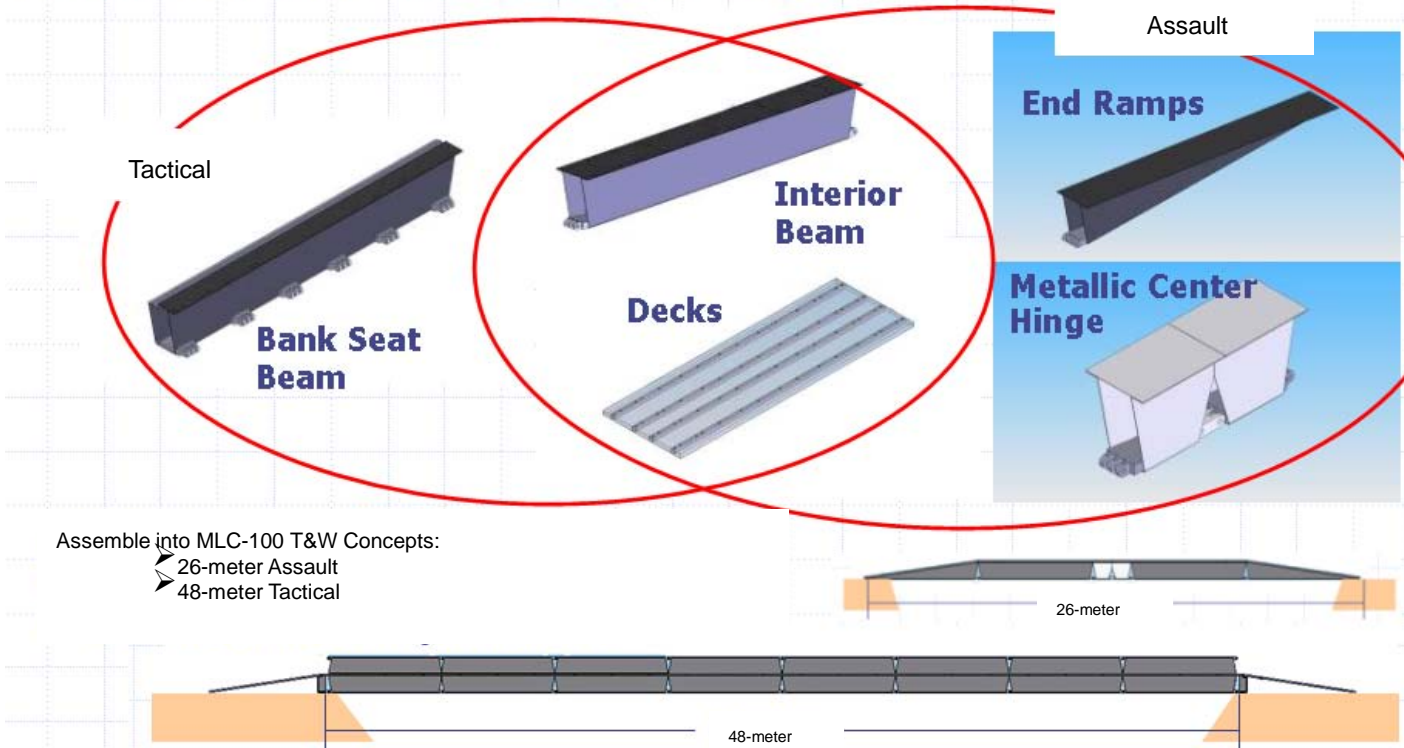


Family of Bridges

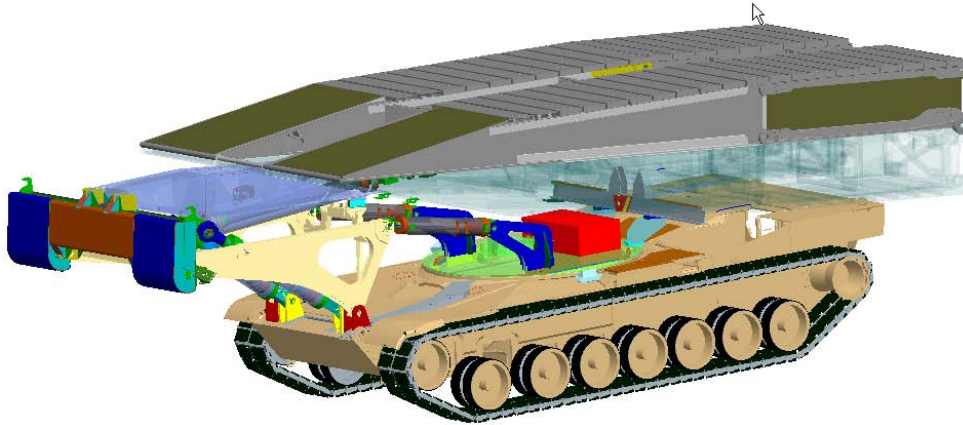
- Type 1:
 - Support crossing of 5 Soldiers within the 95% with full mission equipment
 - Must be able to cross gaps in scalable increments to a total length of 30m
 - Shall be capable of launching within 30 minutes with a crew of 2-8 Soldiers
- Type 2:
 - 8 m minimum length
 - Bridge adapter kit that can be mounted and launched from a HMMWV, BFV, or M113
 - 40 MLC / 50 MLC caution / 70 MLC / 85 MLC caution (O)
 - The operators of the host vehicle (not to exceed a crew of 2 Soldiers), shall launch/retrieve the bridge in 10 minutes or less during daylight hours
- Type 3:
 - Span an 18m wet gap or function as a self propelled raft (T)
 - Have the ability to connect systems together to span larger wet gaps or create a larger self propelled raft (T).
 - 40 MLC / 50 MLC caution (T) / 85 MLC / 110 MLC caution (O)
 - The operators of the host vehicle (not to exceed a crew of 2 Soldiers), shall launch/retrieve the bridge in 10 minutes or less during daylight hours

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Basic Building Blocks



Develop a prospective, single solution for Assault, Tactical and Line-of-Communication gap defeat that communicates in real-time its usage and safe load carrying classification



Joint Program: Army, Marine Corps, and Navy

Development of 6.3 funded technology demonstration full scale composite JAB



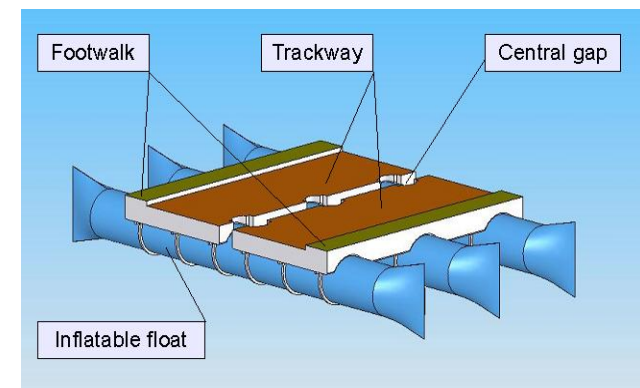
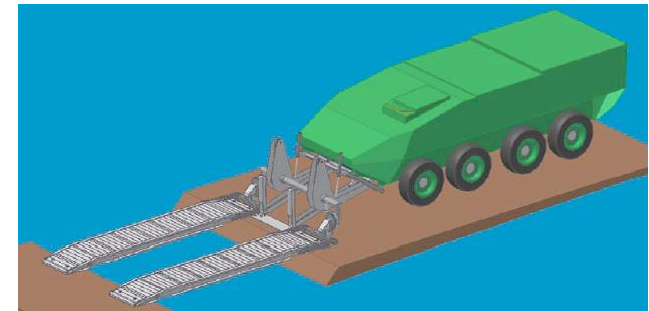
Leverage technology and lessons learned from Advanced Modular Composite Bridge

Requirements:

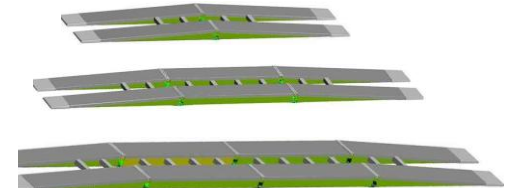
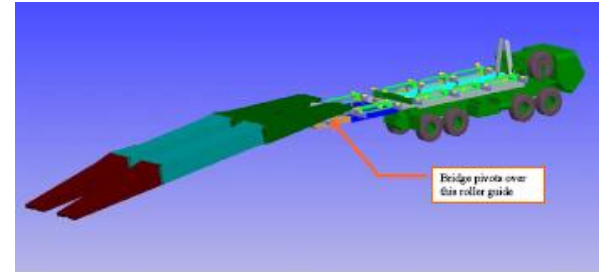
- MLC-100 Load Class at 18m (threshold), MLC-100 at full span (objective)
- span 24 Meters
- interface with JAB vehicle
- deploy/retrieve within 3 minutes (objective)
- allow for traffic of tracked and wheeled military vehicles

R&D Overview

- Title: Rapidly deployable gap defeat technology (GDT) for the Future Combat System (FCS) / Future Force (FF)
 - Description: Provide a 1.5 to 4m wet/dry gap bridging technology that is MLC 30/70 (threshold/objective) capable, C-130 aircraft transportable, weigh less than 3000 lbs., can be remotely operated or autonomous, and can be integrated with future FCS vehicle platforms.
 - Funding Type: Broad Agency Announcement (cost sharing contract: 60% govt, 40% contractor), Phase I
- Title: Innovative Wet Gap Crossing Technologies for the Future Combat System/Future Force
 - Description: Develop an infinite wet gap spanning bridge technology that is C-130 transportable, MLC 30/65 (threshold/objective) capable, and able to be integrated with the Future Combat System vehicles.
 - Funding Type: SBIR (cost + fixed fee contract), Phase II



- Title: Assured Operational Mobility Across Gaps for the (FCS/FF)
 - Description: A flip cantilever bridge and launch technology to remotely deploy a bridge and keep the soldier out of harms way
 - Funding Type: SBIR Phase II
- Title: Gap Defeat Technology for the FCS
 - Description: Sense the gap, Remotely Inflatable Fascines to be dropped in the 1.5 – 4 meter gaps; C-130 transportable, CH47 deployable
 - Funding Type: 6.2
- Title: Advanced Modular Composite Bridge
 - Description: 10 – 26 meter long/MLC65 bridge capable of C-130 aircraft transportation
 - Funding Type: 6.3 Congressional plus up



- Title: Repair and Health Monitoring of Composite Military Bridges
 - Description: Diagnostic/Prognostic Structural Health Monitoring of Composite Bridges and their repair, Field/Depot Repair Methodologies
 - Funding Type: SBIR

